

Table of Contents

INTRODUCTION

Introduction	
<i>Paul Kelley</i>	3

PRE-1940

Introduction: Early Technology	
<i>Carlos Stroud</i>	9
Optics in the Nineteenth Century	
<i>Jeff Hecht</i>	11
Spectroscopy from 1916 to 1940	
<i>Patricia Daukantas</i>	17
Government and Industrial Research Laboratories	
<i>Carlos Stroud</i>	23
Camera History 1900 to 1940	
<i>Todd Gustavson</i>	31
OSA and the Early Days of Vision Research	
<i>Patricia Daukantas</i>	38
Evolution of Color Science through the Lens of OSA	
<i>Roy S. Berns</i>	43

1941–1959

Introduction: Advances in Optical Science and Technology	
<i>Paul Kelley</i>	49
Inventions and Innovations of Edwin Land	
<i>Jeff Hecht</i>	51
Birth of Fiber-Optic Imaging and Endoscopes	
<i>Jeff Hecht</i>	53
Xerography: an Invention That Became a Dominant Design	
<i>Mark B. Myers</i>	57
U.S. Peacetime Strategic Reconnaissance Cameras, 1954–1974: Legacy of James G. Baker and the U-2	
<i>Kevin Thompson</i>	64
History of Optical Coatings and OSA before 1960	
<i>Angus Macleod</i>	68

1960–1974

Introduction	
<i>Jeff Hecht</i>	79
The Discovery of the Laser	
<i>Jeff Hecht</i>	81

Postwar Employment Bubble Bursts	85
<i>Jeff Hecht</i>	
Gas Lasers—The Golden Decades, 1960–1980	88
<i>William B. Bridges</i>	
Discovery of the Tunable Dye Laser	94
<i>Jeff Hecht</i>	
Remembrances of Spectra-Physics	97
<i>David Hardwick</i>	
The Birth of the Laser Industry: Overview	100
<i>Jeff Hecht</i>	
Lasers at American Optical and Laser Incorporated	101
<i>Bill Shiner</i>	
Solid-State Lasers	103
<i>William Krupke and Robert Byer</i>	
Semiconductor Diode Lasers: Early History	107
<i>Marshall I. Nathan</i>	
Lasers and the Growth of Nonlinear Optics	114
<i>Jeff Hecht</i>	
Early Years of Holography	119
<i>Jeff Hecht</i>	
History of Laser Materials Processing	124
<i>David A. Belforte</i>	
Brief History of Barcode Scanning	128
<i>Jay Eastman</i>	
Developing the Laser Printer	134
<i>Gary Starkweather</i>	
History of the Optical Disc	138
<i>Paul J. Wehrenberg</i>	
Interferometric Optical Metrology	143
<i>James C. Wyant</i>	
Half a Century of Laser Weapons	149
<i>Jeff Hecht</i>	
KH-9 Hexagon Spy in the Sky Reconnaissance Satellite	153
<i>Phil Pressel</i>	
CORONA Reconnaissance Satellite	157
<i>Kevin Thompson</i>	
Laser Isotope Enrichment	161
<i>Jeff Hecht</i>	
Lasers for Fusion Research	166
<i>John Murray</i>	
History of Laser Remote Sensing, Laser Radar, and Lidar	175
<i>Dennis K. Killinger</i>	

1975–1990

Introduction	
<i>Michael Bass</i>	183

The Shift of Optics R&D Funding and Performers over the Past 100 Years	
<i>C. Martin Stickley</i>	185
Through a Glass Brightly: Low-Loss Fibers for Optical Communications	
<i>Donald B. Keck</i>	189
Erbium-Doped Fiber Amplifier: From Flashlamps and Crystal Fibers to 10-Tb/s Communication	
<i>Michel Digonnet</i>	195
Advent of Continuous-Wave Room-Temperature Operation of Diode Lasers	
<i>Michael Ettenberg</i>	199
Remembering the Million Hour Laser	
<i>Richard W. Dixon</i>	203
Terabit-per-Second Fiber Optical Communication Becomes Practical	
<i>Guifang Li</i>	209
Applied Nonlinear Optics	
<i>G. H. C. New and J. W. Haus</i>	213
Linear and Nonlinear Laser Spectroscopy	
<i>M. Bass and S.C. Rand</i>	218
Optical Trapping and Manipulation of Small Particles by Laser Light Pressure	
<i>Arthur Ashkin</i>	223
High-Power, Reliable Diode Lasers and Arrays	
<i>Dan Botez</i>	227
Tunable Solid-State Lasers	
<i>Peter F. Moulton</i>	232
Ultrashort-Pulse Lasers	
<i>Erich P. Ippen</i>	237
Ground-Based Telescopes and Instruments	
<i>James Breckinridge</i>	244
Space Telescopes for Astronomy	
<i>James Breckinridge</i>	249
Contact Lenses for Vision Correction: A Journey from Rare to Commonplace	
<i>Ian Cox</i>	253
Excimer Laser Surgery: Laying the Foundation for Laser Refractive Surgery	
<i>James J. Wynne</i>	257
Intraocular Lenses: A More Permanent Alternative	
<i>Ian Cox</i>	262
Spectacles: Past, Present, and Future	
<i>William Charman</i>	265
Major Milestones in Liquid Crystal Display Development	
<i>Shin-Tson Wu</i>	269

1991–PRESENT

Introduction	
<i>Govind Agrawal</i>	277
Birth and Growth of the Fiber-Optic Communications Industry	
<i>Jeff Hecht</i>	278
Telecommunications Bubble Pumps Up the Optical Fiber Communications Conference	
<i>Jeff Hecht</i>	282

The Evolution of Optical Communications Networks since 1990 <i>Rod C. Alferness</i>	287
Integrated Photonics <i>Radhakrishnan Nagarajan</i>	293
New Wave Microstructured Optical Fibers <i>Philip Russell</i>	297
Ultrafast-Laser Technology from the 1990s to Present <i>Wayne H. Knox</i>	304
Biomedical Optics: In Vivo and In Vitro Applications <i>Gregory Faris</i>	308
Novel Optical Materials in the Twenty-First Century <i>David J. Hagan and Steven C. Moss</i>	315
Quantum Information Science: Emerging No More <i>Carlton M. Caves</i>	320

THE FUTURE

Far Future of Fibers <i>Philip Russell</i>	327
View of the Future of Light <i>Steven Chu</i>	329
The 100-Year Future for Optics <i>Joesph H. Eberly</i>	331
Future of Energy <i>Eli Yablonovitch</i>	332
Future of Displays <i>Byoungcho Lee</i>	333
Biomedical Optics—The Next 100 Years <i>Rox Anderson</i>	334
Lasers and Laser Applications <i>Robert L. Byer</i>	336
Optical Communications: The Next 100 Years <i>Alan Willner</i>	338
INDEX	341